Before the

FEDERAL COMMUNICATIONS COMMISSION
Washington, DC. 20554

In the Matter of

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Spectrum Policy -) ET Docket No. 02-135
Comments to the FCC Spectrum)
Policy Task Force on Issues)
Related to the Commission's)
Spectrum Policies)
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Subject: My Spectrum comments

TO: The Commission

Comments by Citizens Media Corp/Allston-Brighton Free Radio, with contributions from the Center for Information, Technology & Society.

These comments will be divided into two sections. The first section will address the public interest elements underlying spectrum allocation. The second will be specific responses to numbered questions presented by the Commission.

Defining the Public Interest in Spectrum Decisions

We know that the question of what constitutes the "public interest," whether overtly expressed or not, is at the core of regulatory discussions. Indeed, the inability to reach consensus on this question has become one of the most important factors in how spectrum-related decisions have been reached. Therefore, in beginning these comments, we feel it incumbent to make manifest what we feel is the unspoken but definite public interest bias with which the call for comments in Docket 02-135 has been constructed and to set forth a specific alternative.

In its call for public comments, the Commission declares that it would like spectrum to be "...put to its best and highest value use." There is no further definition of this phrase.

However, apart from questions about technical application, interference, and spectral efficiency, the Commission's other questions do imbue a tacit definition to this phrase by referring to "transaction costs," "market oriented allocation," "...is there concern that, as congestion rises, spectrum may not be put to its highest valu*ed* use[our emphasis]."

In other words, a careful reader might not be unjustified in believing that the underlying public interest foundation of this request for public comment is solely financial or marketplace concerns. We feel it is important to bring this perception to the surface, as such a framework could, to some extent, pre-determine comments and leave other fundamental concerns unaddressed.

We would suggest that another fundamental view of the public interest must be an integral part of the discussion: How to utilize spectrum in a way that will expedite and encourage what we will refer to in these comments as "democratic discourse." Namely, speech which is predominently concerned with communicating political, civic, or artistic content. Some of the defining features of democratic discourse include its availability to as many citizens and civic organizations as possible, its concern with community(especially local, but not precluding national or international communities) and its unmediated and non-hierarchic nature. The intent of such communication is not the exchange of commodities, but the growth of an informed, enfranchised and active citizenry.

Internet and Broadcasting

While impending restrictions on webcasting and other attempts to create "gatekeepers" do

cast shadows over its future, we believe that the internet does, at this point, represent an environment where democratic discourse can take place. Because of this, the Commission should make all possible efforts to ensure easy and inexpensive access to the internet for all Americans. This means expanding so-called unlicensed areas of the spectrum so that new techniques can be developed to further that end, among them ultrawide band, spread spectrum, maximum input, maximum output, spacial diversity, smart radios and antennas, multi-array antennas and others. Before the refinement of these techniques renders many of the problems of interference obsolete-

and we believe that it can- it is very important to provide ample spectrum to mitigate the "tragedy of the commons."

Despite the value we put on the internet as a vehicle for democratic discourse, however, we must ask whether it is a *sufficient* sanctuary for these values. In at least the short and medium term, we believe the answer is "no." Why? Only half of American homes have internet access and only a relatively small percentage of these have broadband access. A case can be made that in areas where DSL and cable modem access are available, many people are finding these too expensive. Rural areas often lack broadband-access alternatives of any type.

The rapid adoption of wireless broadband access is testament to the desirability of this technology and, as we've said, its growth should be encouraged. However, even as wireless technology continues to improve, we believe that a large segment of Americans-typically the less affluent- will continue to look to television and radio as the fundamental sources of information and entertainment. In other words, as far as the issue of democratic discourse is concerned, broadcasting *matters* and will continue to matter for many years to come.

And with the continuing dominance of broadcasting comes the associated question of how well broadcast media fulfills its role as the primary platform of democratic discourse.

We will explore that question by analyzing the way broadcast media does or does not fulfill the qualities or criteria that we have set out as defining democratic discourse.

First of all, we cited "availability to as many citizens and civic organizations as possible." We will examine this from two perspectives: ownership and other, non-professional media participation.

It is self-evident that the broadcast business is capital-intensive and to some extent, this barrier to ownership has always existed. We make no claims that everyone has the "right" to broadcast, but ownership certainly qualifies as the most direct and intensive form of media participation. In the last few years, this entry barrier has risen to an extreme degree. Whether or not one takes the position that the accumulation of large numbers of stations in a smaller number of hands has, in general terms, been beneficial to the public interest, it's undeniable that the unfolding of this process has had the effect of greatly escalating the price of entry into

ownership. In radio, for example, in 2000, average large market FM stations sold for $119.4 million; in medium markets for $7.0 million and in small markets for $1.9 million[1]

The second criteria we mentioned was "concern with community."

There are several ways to look at this. One way is to note the level of local programming, another is the level of citizen editorials, a third the incidence of local ownership. Each of these has been declining. Time spent on local news and local election politics has also steadily declined.[2]

One of the traditional ways in which broadcast outlets have connected with their community is through the listing of "issues of community concern" in station Public Information Files. That system is increasingly neglected and is tacitly being phased out.

An area of successful democratic discourse in media which is often cited is Public Access Television. First of all, Public Access is _not_ a broadcast creation, it is the result of a quid pro quo with cable companies. Secondly, the inferior production and broadcast facilities of Public Access stations pre-determine the small size of its audience and thirdly, no money is expended to publicize these programs. Apart from the access channels themselves, you can't find individual programs listed in any TV guides on cable or in print. Finally, even the existence of these channels is in jeopardy, with several having been returned to cable operators for alternative use in the last few years.

In radio, there is no comparable public access service. The closest parallel is with the Low Power FM radio service. The fact that there are no LPFM frequencies available in urban areas

renders this a non-viable comparison. Also, there is no financial quid pro quo in LPFM. Each station is entirely responsible for its own financial health.

We would like to raise what we consider a very important manifestation of the disconnect between broadcasters and community. Namely, the lack of any meaningful relationship between community organizations and broadcast media.

In Boston, where our non-profit is located, there are hundreds of community, grassroots and large non-profits organizations, with valuable programs providing information and activism around health, housing, aging, employment, art, education, recreation and many other aspects of

[1] From Radio World magazine, July 3, 2001.
[2] From studies done by the Rocky Mountain Media Watch and the Benton Foundation.

civic life. The idea that these organizations will get little or no media attention(except in the case of scandals) is completely entrenched. As a media educator and broadcaster, when I offer to help such organizations get exposure for the great work they're doing, they are almost shocked.

The National Association of Broadcasters(NAB) has noted the billions of dollars in public service their member stations have given, principally in the form of air time devoted to playing public service announcements. However, the bulk of these were for large national organizations, such as the United Way and Heart Fund, or general announcements of the "Smoky the Bear" variety. In fact, the vast majority of non-profits providing daily service to their communities never get public service announcements played. It is also worth noting that recent studies have shown the lack of effectiveness of psa's; especially on a single media platform and when run during off-hours, as is often the case.[3]

Can these community organizations utilize the internet as a substitute? To some extent, perhaps, but many of these organizations exist in order to serve the very populations that are *least likely* to have internet access; especially broadband access.

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[3] First of all, we must bear in mind that this report represents the broadcast industry- in the form of the NAB- mounting a public relations campaign. There is no outside organization charged with ascertaining the accuracy of the totals involved. It was undertaken by an organization called *Public Opinion Strategies,* Alexandria, VA. This is what it says on the POS website:

"Public Opinion Strategies, recently described as the "leading Republican polling company" by The New York Times, continues to help Republican candidates to victory, going undefeated with a perfect 7-0 in June 4th primaries... Public Opinion Strategies has established itself as a specialist at "combat message development:" Its efforts are not simply to monitor public opinion, but to develop messages that seek to defend client interests that must work to impact complex public policy issues."

Here are the report's financial assertions:
$9.9 billion total public service from TV and radio stations, including
$6.6 billion in psa's and 3.3 billion in disaster relief(including for 9/11)

The average tv station allegedly ran 140 psa's a week(7280 per year) worth 1.1 million-1.3 billion for the whole tv industry. = At 168 hrs per week, that's 1.2 psa's per hour.

The average radio station ran 189 psa's worth(9828 per year) $500,000 per year or 5.3 billion for the whole industry. That's 1.125 per hour.

Those who have listened lately to commercial radio or watched commercial TV might be inclined to doubt the number of psa's alledged as having being played; unless they're played in the middle of the night. That, of course, would defeat the whole purpose of playing psa's.

There is no average psa duration listed. Common sense and experience tells us that the average psa is AT MOST 30 seconds. With that as the standard, that would mean that TV stations are crediting themselves with donating $302.00 each time they play a psa. Radio stations are crediting themselves with donating $102.00 each time they play a psa. I think that very few advertising rate cards would sustain this notion on a national basis; especially during the "graveyard shifts" during which so many psa's are played.

There is an ongoing debate about whether such groups are being well served by broadcast media on the cultural level. It seems clear to us that market forces mean that small, less affluent groups are not likely demographic targets for advertisers and are therefore unlikely to be able to find stations that program musical formats to fit their cultural inclinations. These groups also are unlikely to use the internet as an alternative resource.[4]

The final criteria for democratic discourse that we noted was: "its unmediated and non-hierarchic nature." The broadcast model is both mediated and hierarchical. Pacifica and other community radio stations present minor alternatives to this model, but with the elevated cost of radio stations, it seems likely there will be shrinkage, not growth in this area. The limits of LPFM ahave already been mentioned.

While broadcast spectrum enfranchisees would naturally argue that our current licensing structure and approach have adequately addressed the public interest mandate, we believe that may be true only insofar as they offer a multicplicty of entertainment options. As a platform for democratic discourse, broadcast media has failed.

If the Commission believes in the validity of democratic discourse as a basic public interest tenet, it must take this into consideration when making spectrum decisions. Not to do so will mean that innovations concerning more efficient spectrum use will *only* be implemented for the internet and will not be applicable to broadcast spectrum. It means that the implementation of new technologies will be inhibited by the fact that the large swaths of desirable spectrum inhabited by broadcasters will continue to be considered to be inviolate; subject perhaps to negotiation with the powerful wireless industry, but not available for use by those interested in accessing spectrum for democratic discourse. In light of this, it is interesting to examine the implementation of In-Band-On-Channel(IBOC) broadcasting.

IBOC: Digital Broadcasting?

Given the hybrid parameters it was meant to accomodate, IBOC is an engineering marvel. On the other hand, these parameters are such that a great amount of "special case" engineering was necessary, to the extent that many have called it a very clever "hack." As a

[4] And with the impending implementation of CARP manadates , there will be a considerable diminution of musical choices available on the Internet.

result, the new generation of receivers that Americans will be asked to buy in order to receive this proprietary system will *not* be able to utilize newer, vastly more interesting techniques that would make for a much more efficient use of the spectrum; techniques such as ultrawide band, spread spectrum, maximum input, maximum output, spacial diversity, smart radios, smart and multi-array antennas

and others. The IBOC receivers may be smarter than the ones we use now, but they will not be "smart radios." They will not be software agile and able to adapt to other technologies. At the transmission end, IBOC will not utilize smart antennas and other advanced methods of packet delivery.

In essence, this is a proprietary and exclusionary system, whose implementation will be akin to trying to force supermarkets to stock only one brand of ice cream.

Yet, the implementation of IBOC seems inevitable. And, as a consequence, many human and financial resources that might have been used to implement technology with the potential to *open up* opportunities for democratic discourse will be delayed or postponed indefinitely.

Our point here is not to try and convince the Commission to stop IBOC. Our point is to ask the Commission not to *protect* it, or any other service that limits access to the spectrum. If the Commission does not create a spectrum and regulatory environment where smart radios, smart antennas, mimo and other new techniques can prosper, it will be doing just that–protecting enfranchised spectrum holders from the real competition that such techniques hold and, in the process, severely curtailing new opportunities for economic growth and for an expansion of democratic discourse.

SECTION TWO

1. What specific policy and rule changes are needed to migrate from current spectrum allocations to more market-oriented allocations?

We would like to take issue with the implied premise of this question. Namely, that it is desirable to conceive the question of migration, or any spectrum management issue, solely or predominently on a market-oriented basis. The ultimate extension of this operating principal is to simply auction off of spectrum to the highest bidder. We are strongly opposed to this idea and

compare it to selling off pieces of our National Park system to the highest bidder. It is possible to imagine instances where a private entity could assume a role in managing a National Park-overseeing sanitation, for example. In the same way, we conceive of incumbents as being temporary stewards of a portion of the public airwaves, with this priviledge always subject to oversight by a combination of government and citizen vigilance.

As a governing principal, we believe that no private incumbent's spectrum should be considered sacrosanct. Such auctions as have taken place need to be reevaluated in light of larger, overall spectrum concerns. The Commission has often had to revisit spectrum use on the basis of shifting consumer habits and new technologies and this approach should not change simply because auctions have been used to determine temporary custody of spectrum.

Any arbitrary curtailment of access to spectrum will severely limit the growth of our understanding of how various technologies react in different spectrum circumstances. The development of ultrawide band techniques is especially impeded by this.

2. Should current, restrictive service and operating rules applicable in many bands be changed to provide licensees with greater flexibility? If so, in which bands and how?

While we are not, in the abstract, opposed to flexibility among incumbents, we believe that too much flexibility could allow incumbents to exert excessive control over spectrum management. What may serve the fiscal needs of any two incumbents involved in negotiations may not serve the overall needs of the spectrum.

That said, we are strongly in favor of technical innovation on the part of any incumbent. If rule flexibility is to be at play here, it should be in service of innovation; i.e., the application of new technologies that can open up a particular area of the spectrum for more intensive use; especially public-commons use.

Ultimately, the real question is not whether spectrum holders will be given more flexibility, it is whether more Americans will be able to determine spectrum use *themselves*, with increasingly less need for a centralized provider. By way of analogy, families who have their own solar or wind collectors can use the power generated at their own discretion. They are not subject

to the many regulations, fees, shortages and market-related fiscal tribulations of buying their

power from a coal burning plant. It's evident that the advantage is not just to the consumer, but to the planet.

This same flexibility and conservation principle can be utilized with wireless networks.[5] While alternative power approaches have been ignored or stifled by the power of an entrenched utilities industry, we believe that the Commission has the opportunity right now to advance a spectrum agenda which, from this point of view, is consumer and eco-friendly.

Question 2, section(f)- f. What, if anything, should the Commission do to facilitate efficient restructuring of spectrum held by new licensees and incumbents, i.e., reduce transactions costs, avoid strategic holdouts, and create greater certainty about costs?

As mentioned above, we believe that the Commission's role should be to foster innovation, not to protect the investment of incumbents. Undoubtedly, the largest fiscal concern for any private incumbent, and the most unpredictable, is whether or not the public will be drawn to the service it provides. We realize that the Commission is traditionally concerned with the fiscal viability of the services it licenses, but there is a balancing act to perform here and too often in the past, innovation has been sacrificed on the alter of protecting investments. An example of a negotiation that achieved a successful balance was the spectrum allocation process for satellite broadcast radio. In this proceeding, there was strong opposition from terrestrial broadcasters,
while at the same time there was an opportunity to support a new, potentially innovative service. In the end, adequate spectrum was provided.

We realize that the question of dealing with incumbents is subject to stong political pressures. As in the recent overriding of FCC technical primacy by Congress in the case of LPFM, there is no way to assure that political pressure will not be applied in favor of powerful incumbents. In this context, we will take the opportunity to affirm our belief that the engineering division of the Commission should be as insulated as possible from political pressure. Further,

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[5] Clearly demonstrated by Yochai Benkler, "Building the Commons in Physical Infrastructure," http://www.newamerica.net/Download_Docs/pdfs/Doc_File_122_1.pdf, and David Reed, "How wireless networks scale: the illusion of spectrum scarcity," www.seas.gwu.edu/ ~cjackson/TAC/spectrum%20capacity%20myth%20FCC%20TAC.pdf

we hope that the Commissioners will acknowledge the primacy of engineers in putting questions of migration and flexibility into the larger context of technological innovation.

5. Should more spectrum be set aside for operating unlicensed devices? Should the kinds of permissible unlicensed operations be expanded? What changes, if any, should be made to the rules to accomplish this? Because of the commons aspects of unlicensed use, is there concern that, as congestion rises, spectrum may not be put to its highest valued use? If so, what policies might be considered to anticipate this problem?

As we have stated, the application of innovative technologies such as spread spectrum, ultrawideband, MIMO, smart radios and smart antennas need to be explored in as many areas of the spectrum as possible. This will allow for the development not only of computer-based uses, but for the implementation of agile, stand-alone receivers as well.

It is true that higher frequency bands can provide ever wider bandwidths. However, when passing through barriers, "radio frequency" waves reach their destinations in inverse relationship to their carrier frequency. Commercial ventures attempting to use frequencies above 2 gigahertz, for example 5 gigahertz, have met with failure as the imperative "line of sight" requirement and susceptibility to weather conditions makes these frequencies impractical for multi-point communications, at least, at this point in time. Recent experiences with unlicensed spectrum at 902-928 megahertz and above shows that even these "low frequencies" are too high to support use as a potential tool for community communication.

In 1995 Priest and Komoski recognized the advantages of providing a guaranteed, baseline
wireless support to a community[6] The proposal described the use of frequency hopping and collision detection to employ the "empty holes" in the lower frequencies, empty holes that are still present to this day and will become more abundant after the transition to digital television.

The Commission should consider adopting a policy to facilitate experimental licenses utilizing spread spectrum to extract (make available from these "holes"), at least 10 megahertz of

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[6] <http://www.cpsr.org/cpsr/nii/cyber-rights/Library/Announcements/Wireless-Apple-FCC-Petition>

empty holes below 100 megahertz, and 100 megahertz of empty holes below 900 megahertz, found in almost all regions of the country, for nonprofit, community purposes.

In many parts of the country, such a policy would provide an extremely low cost (and practical) wireless infrastructure. And, the Priest & Komoski proposal, by incrementally cutting back on the bandwidth available to each user in proportion to how much bandwidth they have already used, would assure that bandwidth would be available to all comers.

We would also like to bring to the Commission's attention a particular spectrum area-the Expanded AM band. Our research has pinpointed this area as one which is highly underutilized, especially for a broadcast band.

We are aware that the Commission spent about a decade evaluating the Expanded band and decided to implement a service that would relieve ostensible overcrowding in the regular AM band. At this point, there are only 48 stations operating in that area in the entire country. [7]

While the bandwidth in that area is very small, there should be an opportunity to explore new technologies as possible overlays in that area. Also, with IBOC on hold for the AM band, the Commission should consider allowing low power community stations to operate in that area on an analog basis. Stations that were also committed to experimenting with digital technology in the Expanded AM band would be given licensing preference. Citizens Media Corp plans on filing a complete petition to the Commission within the next six months that will advance this idea.

Interference Protection

7. Are new definitions of "interference" and "harmful interference" needed? If so, how should these terms be defined?

Indeed, one of the fundamental underpinnings of our comments is that interference needs to be seen in a completely new way. Paul Baran, inventor of the packet-switching network principles behind the Internet and founder of Metricom, said in 1994 that spectrum scarcity is a

[7] Complete list at: http://www.angelfire.com/wi/dxing/xband.html

policy choice and that digital and spread spectrum modulation could largely eliminate scarcity by allowing a large number of users to dynamically share the same frequencies.[8]

Compelling explanations of why this is so can be found in David Reed's paper on Spectrum Capacity Myth.[9] In this paper, Reed, shows how the use of spread spectrum, ultrawide band, smart radios and smart antennas, repeater networks, space timecoding and other techniques have the capacity to completely undermine traditional views of interference.

This is the promise of new technology and is the reason why the spectrum as a whole needs to be taken into consideration when a decision concerning any single spectrum area is being considered.

There are several questions in this section concerning power limits and one of the contributions that new research shows is that the enormous amounts of power that we now use to saturate the environment in order to insure radio coverage are a function of archaic technology. "Dumb" technologies are wasteful in the extreme and at many levels: power consumption, raising the overall interference floor and, by their hulking presence on the spectrum, impeding the implementation of new technology.

14. Should the Commission consider developing receiver standards or guidelines for each radio service that would be used in judging harmful interference? For example, should such standards or guidelines aim to protect receivers that meet or exceed the standards or guidelines, but allow users to use less robust receivers at their own risk?

The question of receivers is another piece of the same puzzle. The Commission has historically had to balance receiver standards with consumer demand. In many instances, the short term approach-putting out cheap but sub-standard receivers-has won out. As noted previously, we believe that the impending IBOC implementation will be a graphic demonstration of this.

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[8] Paul Baran, "Visions of the 21st Century Communications: Is the Shortage of Radio Spectrum for Broadband Networks of the Future a Self-Made Problem?" Keynote Address, 8th Annual Conference on Next Generation Networks (Washington, DC, November 9, 1994) (available online at http://www.eff.org//GII_NII/Wireless_cellular_radio/false_scarcity_baran_cngn94.transcript

If the Commission allows the kind of broad-based experimentation that we request, unassailable standards could be developed for receivers. The problem of sub-standard receivers would be obviated by giving amateur radio operators, researchers, entrepreneurs and engineers adequate opportunity to create the foundation for a *new* radio industry, one with scalability and tremendous growth opportunities for manufacturers. Competition would soon drive down consumer costs.

b. How should the Commission consider protecting legacy receivers?

The question of how to deal with legacy receivers has never been handled creatively by government and industry. Unlike the car industry, the radio industry has never made trade-ins a part of its business; nor has it set up radio salvage operations, which might be comparable to auto salvage operations. It has left the problem of old receivers to a re-sale market; think old record store. Unlike old records, however, which may have _content_ that will be viable for a very long time, there is almost no second-use market for radios, despite the fact that there may be components that would be useful or recyclable. Flea markets is about the best we do with old radios.

We contend that if radio manufacturers were to implement resale, trade-in and recycling markets, this effort would not only cause the fastest consumer upgrade in the history of radio, it would have immediate benefits for our landfills and also provide a model for other American industrys which have stuck their head in the sand and said "We just sell 'em, we don't care what you do when you're done with 'em."

We would recommend that the Commission convene a panel of business people, technicians and others who are experienced in re-sale and re-cycling to devise a plan that the Radio Industry would undertake. The upside is large.

16. Some parties assert that the Commission should adopt rules for interference that are based on economics, and not purely technical, in nature. They argue that efficient interference management

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[9]Available at www.seas.gwu.edu/~cjackson/TAC/Spectrum%20capacity%20myth%20FCC%20TAC.pdf

should involve an economic balancing between the parties using the spectrum. Would greater use of these types of alternatives lead to more certain and expeditious resolution of interference issues?

Consistent with our belief that innovation and democratic discourse should be the guiding factors for spectrum decisions, we believe that economics should not be the primary factor in resolving interference disputes. We acknowledge that our recommendation to expand experimentation will introduce less known factors to a particular spectrum area which may give rise to interference claims pitting old and new incumbents against each other.

If interference does become an issue, the Commission should first look at the method of progagation being used, with the burden of adjusting to the interference falling on incumbents who utilize archaic propagation methods, as opposed to those using new, more efficient methods. If both are utilizing advanced technologies, arbitration should be undertaken by a panel knowledgeable in the area of new technology. This panel could be modeled after the Commission's spectrum task force.

Spectral Efficiency

This section asks questions which have largely been covered in our previous comments. We reiterate that increasing spectral efficiency will be contingent on whether technical innovation is allowed to flourish. This will entail a willingness on the part of the Commission to increase unlicensed spectrum, effectively utilize "holes" or undeveloped areas in currently occupied areas of the spectrum, encourage industry cooperation with the Public Common ideal, including approaches that keep intelligence at the edges of the system and prioritize services that foster democratic discourse.

Other ways to give added weight to those interested in increased efficiency include implementing a lower scale of FCC fees for those advancing the cause of more efficient spectrum use, undertaking a panel that will deal with the problem of legacy receivers[10] and expediting experimental licenses.

[10] See question 14 of these comments

Stephen Provizer is Executive Director of Citizens Media Corp and the founder and Station Manager of Allston-Brighton Free Radio, 1670 AM, www.abfreeradio.org,. He has a 20-year career in media, including television, radio and print, as well as an extensive media education background.

W. Curtiss Priest Ph.D., Engineering Science, RPI, is Director of the Center for Information, Technology & Society, consultant to the U.S. Congress on Communications Policy and Education, member, since 1972 of the IEEE , former Senior Public Policy Analyst, MIT, on Communications Policy "One of Newsweek Magazine's Fifty People Who Matter Most on the Internet," 1996 and Associate Director, Learning and Information Communities via Telecommunications (LINCT Coalition)